Office of
Aeronautics and
Space
Technology

IN-SPACE TECHNOLOGY EXPERIMENTS PROGRAM

InSTEP

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LARGE SPACE SYSTEMS

SPACE R&T STRATEGY

OAST

REVITALIZE TECHNOLOGY FOR LOW EARTH ORBIT APPLICATIONS

DEVELOP TECHNOLOGY FOR EXPLORATION OF THE SOLAR SYSTEM

MAINTAIN FUNDAMENTAL R&T BASE

BROADEN PARTICIPATION OF UNIVERSITIES

EXTEND TECHNOLOGY DEVELOPMENT TO IN-SPACE EXPERIMENTATION

FACILITATE TECHNOLOGY TRANSFER TO USERS

IN-SPACE EXPERIMENTS IN OAST

OAST — InSTEP

- **IN-SPACE EXPERIMENTS HAVE ALWAYS BEEN PART OF OAST'S PROGRAM**

  - TO OBTAIN DATA THAT CAN NOT BE ACQUIRED ON THE GROUND
  - TO DEMONSTRATE FEASIBILITY OF CERTAIN ADVANCED TECHNOLOGIES

- **CONDUCTING TECHNOLOGY EXPERIMENTSS IN SPACE IS A VALUABLEE AND COST EFFECTIVE WAY TO INTRODUCE ADVANCED TECHNOLOGY INTO FLIGHT PROGRAMS**

- **THE SHUTTLE HAS DEMONSTRATED THE FEASIBILITY AND TIMELY BENEFITS OF CONDUCTING HANDS-ON EXPERIMENTS IN SPACE**

- **SPACE STATION WILL BE A PERMANENT LABORATORY IN SPACE AND WILL PROVIDE LOGICAL AND EVOLUTIONARY EXTENSION OF GROUND BASED R&T IN SPACE**

IN-SPACE EXPERIMENTS PLANNING

OAST — InSTEP

ASEB PANEL ON NASA'S R&T PROGRAM	JUNE, 1983
INDUSTRY / DOD WORKSHOP	FEB, 1984
ADMINISTRATOR'S POLICY STATEMENT	APRIL, 1984
ASEB PANEL ON IN-SPACE ENGINEERING AND TECHNOLOGY DEVELOPMENT	MAY, 1985
OAST IN-SPACE TECHNOLOGY WORKSHOP	OCT, 1985
INITIATION OF IN-REACH / OUT-REACH PROGRAMS	OCT, 1986
SSTAC AD HOC COMMITTEE ON THE USE OF SPACE STATION FOR IN-SPACE ENGINEERING R&T	AUG, 1987
SPACE STATION OPERATIONS TASK FORCE	OCT, 1987
NASA MANAGEMENT STUDY GROUP (NMSG - 24)	DEC, 1987
NASA CENTER SCIENCE ASSESSMENT TEAM	MAY, 1988

IN-SPACE TECHNOLOGY EXPERIMENTS PROGRAM

OAST — InSTEP

- NASA EXPERIMENTS
  - ARISE FROM THE R&T BASE OR FOCUSED PROGRAMS
  - INCLUDE PRESENTLY ONGOING EXPERIMENTS

- INDUSTRY/UNIVERSITY EXPERIMENTS
  - FOLLOWING THROUGH ON OUR COMMITMENTS IN THE OUT-REACH PROGRAM

- INTERNATIONAL EXPERIMENTS
  - COOPERATIVE ACTIVITIES WITH OUR ALLIES

NASA IN-SPACE TECHNOLOGY EXPERIMENTS

- EXPERIMENTS CONTINUALLY ARISING AS A NATURAL EXTENSION OF R&T BASE AND FOCUSED PROGRAMS CONDUCTED BY NASA, SUCH AS

  - ORBITER EXPERIMENTS PROGRAM (OEX)
  - LONG DURATION EXPOSURE FACILITY (LDEF)
  - LiDAR IN-SPACE TECHNOLOGY EXPERIMENT (LITE)
  - ARCJET AUXILIARY PROPULSION SYSTEM
  - SPACE STATION STRUCTURAL CHARACTERIZATION
  - AEROBRAKING
  - ETC

INDUSTRY/UNIVERSITY IN-SPACE EXPERIMENTS

OAST — InSTEP

- PROVIDE ACCESS TO SPACE FOR INDUSTRY AND UNIVERSITIES TO DEVELOP SPACE TECHNOLOGY

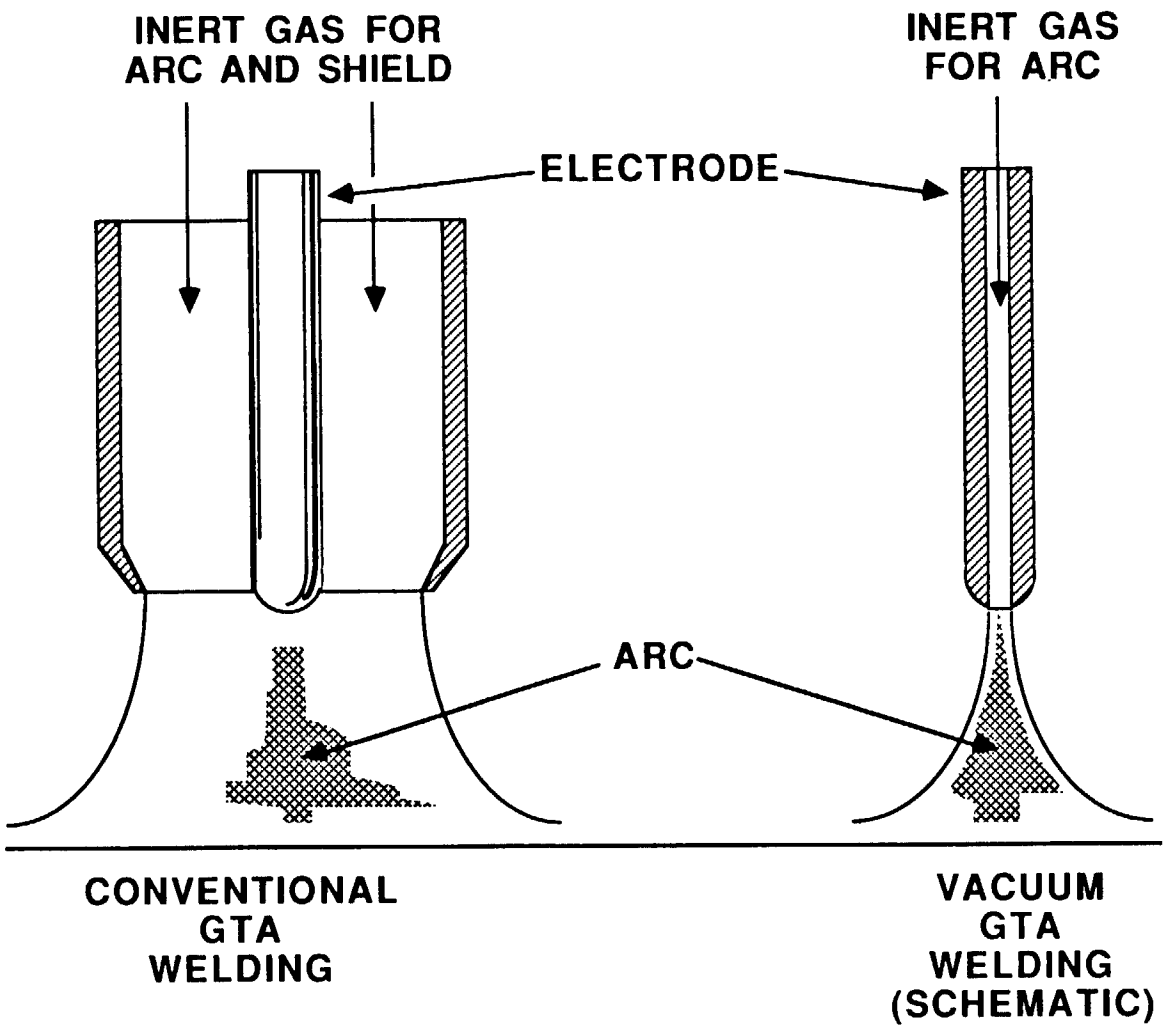
  - ENTHUSIASTIC RESPONSE OF AEROSPACE COMMUNITY TO OUT-REACH SOLICITATION

- OAST HAS COMMITTED TO AEROSPACE COMMUNITY TO SERVE AS CONDUIT FOR TECHNOLOGY DEVELOPMENT IN SPACE

  - PERIODIC RESOLICITATIONS TO INDUSTRY/UNIVERSITY COMMUNITY FOR EXPERIMENT DEFINITION, DEVELOPMENT, AND FLIGHT

IN-SPACE PLASMA ARC WELDING

OAST



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INTERNATIONAL IN-SPACE EXPERIMENTS

OAST — InSTEP

- PROMOTES COOPERATION WITH ALLIES
- LEVERAGES TECHNOLOGY DEVELOPMENT BY OTHERS IN KEY AREAS
- LEVERAGES AND HUSBANDS SCARCE FLIGHT OPPORTUNITIES

IN-SPACE EXPERIMENTS INITIATIVE - PHASE I

OAST — InSTEP

- FLIGHT OPPORTUNITY RESTORED

- INITIATE MORE VIGOROUS PROGRAM ON SHUTTLE AND ELVs

  - OBTAIN DATA THAT CAN NOT BE OBTAINED ON THE GROUND
  - VALIDATE ADVANCED TECHNOLOGIES FOR EARLY USE IN FLIGHT PROJECTS

- GET A RUNNING START ON SPACE STATION

  - GEAR UP NASA, INDUSTRY, UNIVERSITY ACTIVITY
  - CONDUCT SPACE STATION PRECURSOR EXPERIMENTS

IN-SPACE EXPERIMENTS INITIATIVE - PHASE II

OAST — InSTEP

- ROUTINE OPERATIONS IN LOW EARTH ORBIT WILL INITIATE ERA OF BOLD NEW INITIATIVES
  - NEED FOR TECHNOLOGY DEMONSTRATIONS FOR ENABLING TECHNOLOGIES WILL INCREASE
  - THE RANGE OF TECHNOLOGIES TO BE DEMONSTRATED IN SPACE WILL INCREASE
  - SPACE STATION WILL PROVIDE THE FACILITY FOR SIMPLER, FASTER ACCESS TO SPACE
  - SPACE STATION WILL ENABLE EXPERIMENTS NEEDING LONG-TERM HUMAN INTERACTION
- EXPERIMENTS PLANNED AND DEFINED FOR SPACE STATION DURING PHASE I WILL ENTER HARDWARE DEVELOPMENT STAGE

SUMMARY

OAST — InSTEP

- TECHNICAL NEED IDENTIFIED 1983
- PLANNING COMPLETE 1983-86
- COMMITMENTS MADE 1986-88
  - INDUSTRY / UNIVERSITIES (VIA OUT-REACH)
  - CENTERS (VIA IN-REACH)
  - INTERNATIONAL COMMUNITY
- OPPORTUNITY FOR SPACE FLIGHT RESTORED
  - SHUTTLE, ELV MANIFESTING
  - SPACE STATION PLANNING